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ORIGINAL ARTICLES.

THE PRESENT STATE OF OUR KNOWLEDGE
CONCERNING SO-CALLED PARTIAL OR
GRADUATED TENOTOMIES AND
THE HETEROPHORIAS.*

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(*Abstract.*)

THE literature of the subject is extensive and the reports of cases and results of operations too voluminous to even give a brief outline of the most important work. The author gave his conclusions after reviewing the subject.

A small group of men, some of them with extensive experience, condemn the operation as needless, harmful and unsurgical. Another group, and still a smaller one, consider it the only cure for heterophoria.

A large group of men of most conservative habits of thought, voice the following conclusions:

1st. No person should have a tenotomy performed solely because he is the subject of heterophoria.

2d. Very slight degrees should be corrected where troublesome symptoms exist which may be due to the too great use of nervous force on co-ordinating the eyes.

*Read at the meeting of the Western Ophthalmologic and Oto-Laryngologic Association, held in Chicago, April 10, 11 and 12, 1902.

3d. Other means should be resorted to before trying tenotomy, but *unnecessary delay should be avoided*.

4th. Tenotomies should be performed under cocaine.

5th. In judiciously selected cases, when the operation is properly performed, the average results will be quite as satisfactory as the results of most other surgical operations.

It is a mistake to deny that any good can come of a graduated tenotomy. It is always a mistake to claim that all of the ills that flesh is heir to are to be cured by cutting the muscles of the eye.

Others ignore the subject entirely, professing to know nothing about it, and consider it as unimportant.

Dr. Colburn's opinion is that graduated tenotomy can be done so as to correct a true heterophoria without in any way interfering with the range or the nicety of adjustment of the eye, but rather to correct its error and produce orthophoria. The opponents of the operation give no valid reasons why it should not be performed. The uncertainty of the results of prism drill or ocular gymnastics, the loss of time and the danger from relapse render the physical culture treatment, in cases of true heterophoria, unreliable. Correction with prisms may answer the purpose in certain cases, but the error must be of low degree, and unless the patient has an error of refraction, this necessitates the use of glasses which otherwise may not be required.

DIPHTHERIA OF THE CONJUNCTIVA TREATED BY ANTITOXIN.

L. Emmett Holt (*Medical Record*, May 31) found diphtheritic conjunctivitis in a child six months old, and administered 2400 units of antitoxin. A solution of atropine was dropped into the eye and cold compresses applied. In twenty-four hours the temperature had fallen from 102° to 100.8°, and in forty-eight hours to normal. In twenty-four hours a decided change for the better was seen in the eye. On the third day the swelling had diminished sufficiently to enable the child to open its eye, and the membrane was nearly gone. By the sixth day it had disappeared entirely. The diphtheria bacilli were found by cultures as late as the seventh day, and on the tenth day the eye was entirely well.

SECTION AND EXSECTION OF THE RECTUS
MUSCLES FOR COSMETIC EFFECT IN
CASES OF SQUINT INOPERABLE
BY TENOTOMY AND
ADVANCEMENT.*
BY A. E. PRINCE, M.D.,
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IT fell to my lot, about eighteen years ago, to meet a case of divergent squint, due to a faulty operation. An itinerant surgeon, in place of dividing the tendons of the recti interni for an internal squint, had divided the muscles back of the perforation through the capsule of Tenon. Before that time I had made some efforts at advancement in similar cases, without satisfactory results; and in this particular case, I determined upon a procedure which has stood the test of experience for a decade and a half, and which I venture to recall to your minds to-day, in the hope that it may receive a candid criticism of its merits.

I say recall to your minds, because I read an account of the procedure at the meeting of the American Medical Association at Cincinnati, Ohio, in 1888, and some of the matter of this paper may be found in the *Journal of the American Medical Association* of the date of October 13th of the same year.

I am encouraged to bring it to the notice of the profession again by the belief that it failed to become a part of the living knowledge of ophthalmology, not for any demerit it possessed, but because it failed to receive sufficient attention at the time to lead operators to test its value.

That oculists are not alive to the usefulness of the procedure is impressed on me occasionally by the presentation of cases who have been seen by competent oculists, who have failed to offer any plan of relieving the embarrassment and mortification due to the cosmetic defect of paralytic squint.

The following is a case in point: On Nov. 4, 1898, Mr. Skinner of Peru, Ind., called on me with what he considered a hideous deformity due to a paralysis of the internal rectus of the left eye. He was and is a ticket agent in the employ

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of the Wabash R. R., and is obliged by the nature of his business to stand at the window and meet the gaze of thousands of ticket purchasers.

He had had two operations performed to correct it, by able oculists, and, upon consulting a third, received the candid answer that "it was among the impossible things," since the internal rectus was absolutely paralyzed, and the external rectus was contracted in the orbit. There being no possibility of establishing an opposing force, the eye must retain the condition of maximum, motionless abduction.



FIG. 1.

His desperation and consciousness of his deformity increased until he consulted me, with the purpose of having the eye removed and a glass eye substituted. When I told him that his eye could be straightened by the simple procedure of paralyzing the opposing muscle, he was incredulous; but the result of the operation made him almost ecstatic, and he continued to thank me from time to time for the cosmetic result, which is shown by the accompanying recent photograph. (See Fig. 1).

The case of a nurse at Pontiac, Ill., Miss B., is another example which I might advance as an excuse for introducing this subject to the profession a second time.

She had had a faulty tenotomy, or rather myotomy, in former years, which had led to a life of mortification. She had seen a number of oculists, who had invariably discouraged her from having anything done.

Upon being consulted, I unhesitatingly told her she had certainly come to the right place, for, so far as I knew, no one but myself was correcting such deformities as hers. If I was wrong, I will offer an apology. She submitted to an exsection of the external rectus back of the equator of the eyeball, and when she left the hospital, six days later, nothing so well expresses her gratification as a remark of one of the patients, who said: "She is as happy as a shouting Methodist."

The purposes for which this operation may be performed are four in number:

1. Permanent atrophy or paralysis.
2. Irrecoverable loss of either rectus through accidental section of the muscle back of its capsular perforation.
3. Extreme over-correction of long standing, following tenotomy with excessive laceration of the capsule, permitting the retraction of the tendon back of the equatorial meridian, whence, owing to atrophy or adhesions, it cannot be successfully advanced.
4. Irrecoverable traumatic dislocation of the rectus.

Cases belonging to the paralytic class are not very infrequent. The class of accidental section of the muscle in place of the tendon (formerly very large, before the relations of the capsule were understood) is assuming diminished proportion, and new cases are seldom produced except by the most inexperienced charlatan.

The third class is becoming smaller in proportion to the attention paid to the preliminary correction of ametropia, and the frequency with which advancement is employed in the correction of high degree of squint.

In the fourth class my knowledge is limited to the observation of Case 7.

The clinical aspect of these conditions needs no particular

consideration. The unpleasant appearance of an extreme deviation, especially when outward or upward, and accompanied by restricted motion, is too familiar to be mistaken. The exceptional reference, if any, to be found in the literature of treatment, and the acknowledged inefficiency of tenotomies and advancements in correcting these deformities, justify the brief outline of the following cases, which have led to the adoption of the present mode of practice:

CASE I.—One of the series of unsatisfactory results following attempts to correct a paralytic condition by advancement.

Mrs. D., aged 45. In childhood both interni had been tenotomized in an unknown manner, resulting in a moderate over-correction, which later in life became a divergence of both eyes, measuring together 70 degrees. The interni were so inefficient that the axes of neither eye could be brought parallel to the meridian plane. Lateral motion was restricted to 30 deg. in the right and 25 deg. in the left eye. The operation performed was a tenotomy of the externi with advancement of the retracted internal recti. Each internus was found attached to the posterior hemisphere of the ball. The advancement was accomplished in a satisfactory manner, and the result was a temporary success. Soon after her discharge a slight divergence (10 deg.) was observed, but in contrast with the gravity of the former condition was not regarded as a bad failure. For three months the divergence increased, until it would have been difficult without actual measurement to determine any material improvement.

This failure is introduced as a type of the results which will attend the attempts to restore the equilibrium through advancing a muscle which has remained for many years retracted in the orbit, becoming atrophic through inactivity. The superior strength of the opposing muscle, though tenotomized, will assert its supremacy, and the correction will not be permanent.

CASE II.—Section of both recti, posterior to their capsular perforation.

Barney Burns, Sidney, Ill., aged 43. From infancy to the age of twenty years, he was the subject of a marked internal squint. At that time his father entertained a guest

over night, who made it his business to travel the country and straighten cross-eyes. It was considered a rare fortune thus accidentally to have presented an opportunity which might never occur again, for they were very poor, and he was willing to straighten both eyes for his lodgings and two dollars and a half. A week later, when Dr. Strabotomist was pursuing his calling many miles away, it was considered safe to expose the eyes to the light, when the following condition was revealed:

Both eyes were deviated extremely outward, measuring with Snellen and Landolt's method, 50 degrees in the right eye, of which a portion of the iris was concealed under the external canthus and the lateral motion limited to 10 degrees. With $H=1.5$ D. corrected, $V=\frac{20}{20}$. In the case of the left eye external deviation was 40 degrees, lateral motion 15 degrees, $H=1.5$ D., $V=\frac{20}{40}$. Direct vision was very imperfect, but by turning the head to bring objects into the visual axis of either eye he could see tolerably well. As he was very anxious to have an effort made for the correction of his deformity, and bearing in mind my experience with advancement in this class of cases, it was explained to him that his muscles had been divided too far back, to correct which as bad an operation would be attempted on the external muscles as his two-dollar-and-a-half operation had been on the internal muscles, and that it was hoped by the aid of a stitch to be able to effect a parallelism, so that he would look well and have direct vision, but he must not expect to have lateral motion, for, with the lateral attachment of both eyes destroyed, he must be satisfied if they were simply straight. With this understanding the operation was undertaken. A lateral incision was made above each external rectus, and the hook introduced far back, exposing the muscle, which was divided outside the capsule. An internal advancement suture, to avoid subsequent deviation, was placed in each eye. The after-treatment consisted of a moist compress of carbolic acid, one-half per cent. No pain followed the operation. On the fourth day there was an inward deviation of 5 degrees, which was not noticeable. No deviation has occurred in the interval of seven years which have elapsed.

The most gratifying and at the same time surprising fact,

especially worthy of note, was the unpredicted amount of lateral motion, which in the right eye amounted to 40 degrees, and in the left eye to 45 degrees. To account for this unexpected success, the theoretic explanation is advanced that both external and internal recti formed a union with the posterior hemisphere of the capsule, for it is scarcely probable that so great an amplitude of motion could be accomplished by the recti muscles acting alone on the orbital cellular tissue. Another consideration (concerning which, it must be confessed, some apprehension was entertained) was the danger of exophthalmus, consequent on destroying the ocular attachments of the two opposite recti muscles. The entire absence of this effect is likewise regarded worthy of note.

CASE III.—Complete paralysis of the sixth nerve, treated by exsection of the rectus muscle.

Mr. T. A. D., Oneida, New York, aged about thirty years, presented himself at the College of Physicians and Surgeons, New York, with a condition of complete paralysis of the external rectus of the left eye, following a railroad accident twelve years since. In the collision his head was jammed between two cars. The recovery from the injury was rapid, leaving no other effects than an extreme internal deviation with partial concealment of the iris. Some years after an unsuccessful operation was performed. Tested at the College and also at the Manhattan Eye and Ear Infirmary: V=counts fingers at six inches, internal deviation about fifty degrees, absolutely no motion.

Being in the city, by the courtesy of Dr. Webster I was extended an invitation to demonstrate my method of advancement on the following day at the Manhattan Eye and Ear Infirmary. Judging from the amount of motion obtained in the case related above, it was thought that a simple section of the muscle back of the capsule would be insufficient; that an attachment to the posterior hemisphere would probably occur and reproduce a partial internal deviation. It was therefore determined to exsect the muscle as far back as possible, the intention being to destroy the efficiency of the internal rectus. Under the influence of cocaine, the globe was rotated with fixation forceps as far to the temporal side as the contracted and hypertrophied muscle would permit, in

order to allow of the introduction of the hook. Parallel lateral incisions were made, liberating the muscle, which was drawn out by the continued traction of the hook and divided at the remotest accessible point. The anterior portion was then separated from the sclera. An external advancement suture was inserted to hold the eye in position, and it was kept moist with a saturated solution of boric acid. No especial reaction followed the operation.

The stitches were removed on the fourth day. The eye was cosmetically straight. No exophthalmus or unnatural appearance existed except the absence of lateral motion. He left the hospital satisfied, with still some little ecchymosis, rapidly absorbing.

CASE IV.—Exsection of the anterior portion of the extenus for the correction of a paralytic divergence following faulty operation for internal strabismus forty-four years ago.

Mrs. H., Carrollton, Ill., aged fifty-three. At nine years of age had an operation for the correction of convergent strabismus, resulting in an extreme over-correction of the left eye only. The angle of the deviation was forty-five degrees, and the lateral motion did not exceed ten degrees.

The staring effect of the divergence, combined with the loss of motion, was a constant source of embarrassment. She was especially anxious to have the deformity corrected, since in the capacity of the wife of a Methodist minister she frequently changed her abode and made new acquaintances.

With an understanding that parallelism, with but partial restoration of motion, was all that could be certainly secured, it was determined to advance the internus if possible, to exsect a portion of the extenus if necessary.

Under cocaine an incision over the internus was made and forceps introduced to secure the retracted muscle, which was found but could not be satisfactorily advanced owing to the cicatrization and long-standing contraction of forty-four years. A suture was introduced to be subsequently employed to overcome the divergence. The tendon of the extenus secured by fixation forceps was then separated from the sclera and freed from its capsular attachment by four incisions parallel to its course. Thus permitted to assume its meridian plane, it was brought into and secured in this

position by the suture previously placed in the contracted internus. Lastly the anterior contused end of the externus, thus far held by the forceps, was removed, allowing the muscle to retract into the orbit. The stitches were removed on the fourth day, when she went to her home, from which she has written expressions of satisfaction with the result. Motion is very good, and I regret not being able to give it in degrees. No exophthalmus exists.

CASE V.—Exactly similar to the preceding. Mrs. S., Springfield, Ill., aged fifty-four years. Operated for internal squint at ten years of age. Slight divergence of left eye at first, became more marked as she grew older, partly owing to the relinquishment of her accommodation ($H =$ plus 2.50 D.) She gradually lost control of the lateral motion, which was reduced to five degrees, and finally consulted me concerning pain, which was assumed to be due to the permanent contraction of the externus.

The foregoing considerations led to the adoption of the method of treatment employed in the previous case, with similar results, except that the lateral motion obtained was more limited, not exceeding twenty degrees. The eye appears straight during direct vision, pain has disappeared and she has been enabled to do an indefinite amount of sewing without discomfort. No especial increased prominence of the eye is observed.

CASE VI.—Similar to the two previous. M. K., Kansas. Mr. K. is a German Lutheran preacher. He states that the extreme divergence of the right eye resulted soon after an operation for internal squint. This occurred in childhood while he was still in Germany.

One operation for the correction of his deformity had failed, but he was sufficiently intelligent to appreciate the method suggested, of first accomplishing what was possible by an advancement and then weakening the externus sufficiently to restore a balance of the opposing forces.

The mechanical procedure was a repetition of the foregoing, and the result satisfactory to the patient. The lateral excursion amounted to thirty-five degrees. There was no apparent exophthalmus.

CASE VII.—Dislocation of the inferior rectus, and di-

vergent strabismus, twenty-five degrees, following injury; treated by exsection of the superior, tenotomy of the external and advancement of the internal recti.

Mr. J. P., Camden, Ill., aged thirty years. Fourteen years ago, while walking under a tree, he was struck in the right eye by a broken branch, causing him to fall to the ground. For three hours he suffered pain and nausea. The eye was dressed by Dr. Mead of Huntsville, who removed some pieces of bark, after which the swelling was too great to permit inspection for eight days. At that time the eye was found deviated upward, carrying the upper lid with it. There was no power of downward rotation. The eye deviated also outward, but the lateral motion was good. He reports the condition to have suffered no change since the injury. The external deviation is found twenty-five degrees, and the upward deviation thirty degrees and paralytic. The maximum of lateral motion not noted.

The eye appears slightly exophthalmic. The upper lid would descend by a voluntary effort, but in the condition of rest it was elevated, making the vertical diameter of the palpebral fissure one-half greater than that of the fellow eye.

By an effort at closing the lid, slight downward motion of the ball was effected. The permanent upward rotation of the eye subjected the inferior portion of the cornea and adjacent sclera to continued exposure, causing it to be always congested, and at times badly inflamed, preventing sleep. No epiphora existed.

Operation.—The correction of this rare deformity was planned as two operations. The first, to restore a balance of muscular efficiency in the vertical plane. The second, to correct the external deviation in the horizontal plane.

Under the influence of cocaine, an incision was made over the location of the inferior rectus. By the grasp of the forceps muscular action was observed, but owing to the extensive long-standing cicatrization no effective advancement could be made. An inferior advancement stitch was introduced, and an attachment made to the sclera. The next step was to weaken the superior rectus sufficiently to permit the enfeebled inferior successfully to oppose the force of its antagonist. Accordingly, its tendon was detached from the

sclerotic and secured by forceps. The effect not being sufficient, the muscle was liberated from its capsular attachment by incision parallel to its course. It was thus rendered possible, by means of the inferior advancement suture, to secure a parallelism in the horizontal plane. *The superior rectus was then shortened and allowed to retract back of the equatorial meridian of the eye*, that it might not overbalance the strength of the dislocated inferior rectus. The immediate result was good. Some vertical motion was restored. The lids closed naturally, covering the ball.

Three days later the patient reported slight pain since the operation. Conjunctiva much congested. Vertical motion thirty degrees. Amount of exophthalmus unchanged, but less conspicuous, owing to the closure of the lids over the sclera.

April 20th, 1888, two months later. Returned for the correction of the external strabismus, which still remains twenty-five degrees. At this time there were five degrees of superior deviation. Vertical motion measured thirty degrees.

The external deviation was corrected by a tenotomy of the *externus*, with an advancement of the *internus*.

Operation.—The amount of muscle to be excised must be determined by the operation in each individual case. In complete paralysis complete exsection will be required.

In all cases of partially atrophied muscles contracted in the orbit, some muscle should be left to oppose its remaining available efficiency. Common sense and good judgment will be required in making a correct estimate of the needs of the patient.

The eye should be held in position by an advancement suture when indicated. The operation I invariably use is the single suture operation, described in the *Ophthalmic Review*, September, 1887, and subsequently in the *Archives of Ophthalmology*, October, 1893. The interest which is taken in the operation (which is a necessary part of the operation in question in many cases of partial paralysis or over-correction) leads me to make the following extract from the *Archives of Ophthalmology* of the above date:

“*Materials.*—Not finding a satisfactory forceps in the market, Tiemann has filled this want for me.

“The introduction of a suture into the episcleral tissue is facilitated by a very slender, sharp, curved needle, with a comparatively large eye, designated by Tiemann as No. 25. Each will exercise his choice relative to a fixation forceps, but preference is given to that of Critchett, because, having two fine guarded points, the sclera is fixed directly without traction on the yielding conjunctiva. The suture preferred is fine, strong, black, iron-dyed silk, such as is furnished by Tiemann, and designated No. 3.

“*Operation.*—A conjunctival incision is made over and parallel to the attachment of the tendon of the muscle to be advanced. The tendon is secured by an advancement forceps, separated from the sclera and advanced, allowing the conjunctiva to retract.

“A slender eye needle, half-curved (Tiemann No. 25) is passed from without forward, perforating the conjunctiva,



muscle and capsule. It is then made to pass outward in the reverse order, from which it can neither slip nor escape.

“The sclera now being fixed, preferably with Critchett’s short fixation forceps (Weiss), an unyielding anchorage, in the form of a fibrous pulley, is secured in line with the rectus by introducing the needle into the dense episcleral tissue 2 mm. from the sclero-corneal junction.

“Both ends of the suture are now brought together, forming the first portion of a surgical knot, and tightened to effect a slight over-correction. This may now be secured or provisionally held by the application of a bow-knot until the muscular tonicity shall have returned, thus enabling the effect to be modified at any time before adhesion has taken place. This suture is permitted to remain four days, unless it is desired to diminish the effect, which may safely be done after forty-eight hours, by removing the suture and opening the wound with a small strabismus hook.”

The indications for a tenotomy of the opposing rectus are

the same as those which constitute the guide in other operations for advancement.

Conclusions.—The conclusions suggested by the above cases are:

1. In the case of complete internal paralysis of either rectus, the exsection of the opposing muscle will enable the eye to be retained in the straight position without motion in that meridian.

2. In a case of retraction of either rectus muscle into the orbit, under conditions rendering its advancement impossible, an equalization of the deviating power is to be obtained through section of its antagonist, posterior to its capsular attachment, following which, excursions in that meridian will be restored to an extent varying between twenty and fifty degrees.

3. In case of paralysis or retraction of either rectus, the operation of section or exsection of its antagonist has not been observed to develop or increase any pre-existing exophthalmus to any marked degree.

DISCUSSION.

DR. REYNOLDS, Louisville.—I believe I did the first tenotomy for the relief of cyclophoria ever done. The account is published in the *American Practitioner* for November, 1873. I think that is the first one done. It was an exceptional case. Have never had just such another one. Cyclophoria to a slight degree is constantly found, but, in my experience, I have seen no other case that seemed to demand operative interference; and when I heard of the axis of the cylinder being set at 10 degrees, or 70 degrees, or 100 degrees, I have in my mind at once the supposition that the apparent cyclophoria might readily be overcome by an attempt to have the patient see through cylinders set at 90 degrees or 180 degrees. That the graduated tenotomy has a limited field of application we are all prepared to admit, but for nearly twenty years I have been practicing an operation that has not been published, I think, of shortening the capsule over the tendon of the weak muscle instead of over the stronger one. We cut out an elliptical portion of the capsule directly over the insertion of the tendon, and I fancy I am able to

correct 10 degrees of lateral deviation, either outward or inward by this operation. Shortening of the capsule stimulates the weak muscle, and it is given less work to do while being stimulated, and the opposing muscle does not overcome it in a great many instances. I have had a few failures, but they are exceptional where 10 degrees of outward or inward deviation exists. Instead of cutting the tendon of the strong muscle, I strengthen the tendon of the weak muscle, and introduce two or three sutures. I never think of prescribing the cylinder set at 80 or 100 degrees, but I set it up to 90 degrees at once, and in a moment the patient is able to see satisfactorily. I had the same condition myself for a number of years, with axis at 80 degrees, but I found no comfort till I had the cylinders placed at 90 degrees.

DR. JACKSON, Denver.—It seems to me that Dr. Prince's paper is one of practical importance. There are a certain number of these cases that have been going from one to another without getting relief, and, with the rare experience he has had, I think it would be interesting to know his exact results. I want to mention that class of cases which has complete paralysis of the muscle. I have seen two or three, and if I see another will try his method. I mean the cases of complete ocular paralysis following periodical paralysis. Several years ago I enucleated an eye that had some light perception still, but was displaced several mm. forward and was displaced outward until the cornea was habitually behind the outer canthus. I do not see why such a condition could not be prevented by an exsection of the external rectus, possibly with some interference with the superior oblique, as they act in very much the same direction. I think it is justifiable to mention this, so that anyone who meets an extreme case should think of it and try it. Possibly the superior oblique can be transplanted. We are getting some experience in this mode of transplantation. Possibly it can be so attached to the eye-ball that it will have some influence in opposing the outward movement. It would require that the muscle be displaced back some little distance. I think it would be possible to so attach the muscle to the eye-ball that it would oppose the external rectus.

DR. HOTZ, Chicago.—I fully agree with you this is not

an easy subject. We all know that. The more we study the question of heterophoria and the legitimate way of relieving it, the more we feel we are getting into deep water. One difficulty I am reminded of by the remarks of Dr. Reynolds about the weak and strong muscles. The difficulty is often to decide which is the weak. The strong is usually shown by the capability of the muscles to overcome prisms. If there is esophora, that means an adducted position of the eye ball, the external rectus has to expend a good deal of its power to turn the eye straight before it can turn it to divergence. I confess that in the majority of cases I am at a loss to understand whether we have to deal with a muscle too strong or one too weak. There are cases which at the distance show a slight degree of esophoria—4 to 6 degrees—and at the reading distance this is decidedly increased. I have seen such cases up to 16 degrees. I think we are safe regarding a case as one of abnormal tension of the internal rectus and can safely perform the graduated tenotomy on that muscle. As a rule I hesitate to weaken the internal rectus. I am glad to see the rather conservative position Dr. Coleburn took because that is working in the right direction. I have seen a great many cases of esophoria in which the correction of the refraction does not change the esophoria. I know that many times hypermetropia causes an apparent esophoria which disappears totally or partly after the correction of the hypermetropia. I have seen cases where glasses relieved the cause, showing that the esophoria played no role in the disturbance. We are much at sea to determine the truth in all these muscular disturbances. It is very well to say that general principles rule these troubles and that we can help them by improving and building up the nervous system. But the patients do not want to be treated on theoretic principles. They want relief, and if you operate on their muscles and they do not get relief in a reasonable time they do not thank you for it and the work does not add to your credit.

DR. BULSON, Ft. Wayne.—I should be very glad if this subject were placed on a rational basis. I believe many have been led astray by the theories of men who have become famous as exponents of this method of operating. Personally I have seen some disastrous results following graduated

tenotomy. I know a young man who had six graduated tenotomies made in New York City, and he is worse than before he was operated upon. Some of my friends have reported similar experiences. I believe we should make long and painstaking observations under a cycloplegic and in many instances we can thus obviate the discomforts arising from graduated tenotomies. I have had but little faith in them at any time. I have seen so many good results following a careful correction by glasses, and by that I mean a prolonged examination, looking for the minutest errors and correcting them, that I have grown to look upon graduated tenotomies when this had not been carried out, as unnecessary. I am somewhat in favor of the operation spoken of by Dr. Reynolds, and which Fox has mentioned, taking out an elliptical portion of the capsule and stitching it. I believe it can be used, in the manner directed by Dr. Reynolds, with a great deal of success, particularly in that class of cases which have a moderate amount of error. Fox uses it in the correction of divergent strabismus, performing a tenotomy of the external rectus and at the same time an exsection of the capsule over the internal rectus. In well selected cases this will answer a suitable purpose I believe. I doubt if we have too strong a muscle in the cases, in which there is a practical parallelism of the eyes. It is more rational to strengthen the opposing muscle than to cripple one which is apparently too strong.

DR. SUKER, Chicago.—In reference to Dr. Coleburn's paper, I am inclined to fully believe what Dr. Bulson has said and I agree with him in this particular. In all of these conditions of esophoria, exophoria, hypo- and hyperphoria we lose sight of the personal ego, that is to say, the general muscular tone of the patient in reference to the power of accommodation and convergence. I thoroughly believe that the majority of these cases can be cured, provided the absolute refraction is taken under complete mydriasis and thorough cycloplegia. I continue, if necessary, the use of the cycloplegic for weeks, in order to get the true status of refraction, for I do not believe that any interference in a surgical way should be undertaken upon any extra-ocular muscle for any condition of imbalance whatsoever, unless the true refraction has been ascertained and the proper glasses have been pre-

scribed and worn. In only the very exceptional cases might a partial tenotomy be indicated. In reference to the insertions of the tendons as outlined by Dr. Coleburn in his admirable text-book and often mentioned before local societies here, I would like to take an exception. If what he says, that all the extra-ocular muscles are inserted, as it were, by a common sheath into the sclera—in other words, attached to a circular insertion, then a partial tenotomy would violate one of the physical principles, i. e., action and reaction in opposite directions are equal; hence the partial snipping of a tendon or muscle would lose its effect because its influence would be disseminated, which would not be the case had each muscle a separate insertion. In all my dissections, which now number over 200, in this very particular, I have never been able to demonstrate this common insertion of tendons, as outlined by Dr. Coleburn. I grant you, any inflammatory reaction in the capsule of Tenon or the tissues immediately surrounding the muscles might so bind them down or agglutinate the parts so as to make it appear as one tissue. But this is a pathological lesion and not a normal condition. Hence, it cannot be a point to be taken into account in endeavoring to establish a surgical procedure. Each extra-ocular muscle no doubt does spread fan-like at its point of insertion, yet never is this spreading so great as that the extreme fibres of the tendon will come in contact with the tendon of any other muscle in the same plane. As before said, if you take into consideration the normal power of the muscles in relation to the demand made upon the power of accommodation and convergency, in such cases where an esophoria or exophoria, or any other kind of an heterophoria obtains, then the wearing of the properly adjusted glasses will alleviate the trouble. This is so, because the symptoms in these cases are made manifest for the reason that the nerve stimulus first gives out before the muscular stimulus is exhausted. In other words, in any case of exhaustion or tiring, the nerve first gives out and then the muscle. Hence, if you institute in these cases a tonic course of treatment with ocular gymnastics in addition to the proper glasses, you will achieve a cure in the great majority of cases, and leave a partial tenotomy only for the exception, which, indeed, is very rare.

DR. J. A. BRADFIELD, La Crosse, Wis.—I think we have allowed our discussion to wander into the subject of heterophoria rather than keep to Dr. Coleburn's paper. I agree with Dr. Suker regarding the attachments of the tendons to the eyeball, and in taking this view that a partial tenotomy of a tendon will produce no positive effect by the subsequent cicatricial contractions. The tendons, however, are very closely connected with the capsule of Tenon, and this connection should always be considered in a tenotomy, and in no case, excepting perhaps of the antagonizing muscle, should this connection be utterly severed. When a tenotomy is made of the tendon and on one side of the connection to the capsule, whether it is advanced or allowed to retract, the relation of the muscle to the eyeball is changed, and not only the optical axis is changed but a tortion or cyclophoria is produced.

DR. PRINCE, Springfield, Ill.—I want to call attention to the importance of being very sure in making an exsection to correct paralysis of the opposing muscle that your case is one of permanent and irrecoverable paralysis. If you have this, my experience leads me to believe that you will be absolutely satisfied that you have done the patient a great deal of good by making the complete exsection. If it is only a partial paralysis which is associated with a large degree of abduction or adhesion, the partially paralyzed muscle may have some force left and thus give an over-correction. I have had one case where, after making an exsection and getting temporary satisfactory results, the patient's paralysis recovered, showing my diagnosis was not correct as to the eye being permanently paralyzed, and that gave me an over-correction on the other side, necessitating exsection of both muscles. My reputation did not suffer particularly, because in the first place we had a paralyzed muscle and corrected it, and in the second I had a paralyzed muscle of my own production. I do not think there is much in the subject to make one hesitate at it; the technique is not appalling. I have never had a case of exophthalmus following the operation. When from paralysis the eye rotates in one direction and neither muscle has much effect in holding the eyeball in the socket, it does not prolapse any more than before the operation. In no case

is the exophthalmus increased. If you will do this you will gratify some patients. I have had six of these patients that had been turned down by others and I got excellent results.

DR. COLEBURN (closing discussion).—I have little to say in response to the discussion of my paper, because very few of the remarks made pertain to my paper in any way. I only meant to discuss the question of the use of graduated tenotomy in cases of true heterophoria, eliminating all possible factors before attempting the operation. Also eliminating all possible rheumatic or toxic origin that might exist. I try to be perfectly honest with my patients in this work. Regarding the expansion of the fibres, it exists and it certainly has to do with the moving of the eye and is a factor in the graduating tenotomy. Regarding Dr. Bulson's position, I have little to say. I think for a man who has never given it any attention to condemn it, is unfair. I think there is much to be considered in these auxiliary tissues, and I have devoted a great deal of time both on the living patient and the cadaver and tried to elucidate some of these questions. The method of Fox is of great value. The determining of weak and strong muscles is always annoying. I think observations concerning the attitude of the patient in the use of his eyes, when he is not aware of your observation, will aid you in determining which to do.

THE SUPRARENAL GLAND AND ITS PREPARATIONS
IN OPHTHALMIC PRACTICE.

G. E. De Schweinitz (*Therapeutic Gazette*, July 15) finds the suprarenal preparations of value in hyperæmia of the conjunctiva when due to local irritation, to relieve congestion, irritation and lachrymation caused by ordinary conjunctivitis, and in the treatment of blephorospasm and spring catarrh, where they have a decidedly curative effect. He finds them advantageous in trachomatous pannus and various types of vascular keratitis, and to enhance the action of cocaine, atropine, eserine and pilocarpine. They facilitate the introduction of lacrymal probes by lessening the congestion. The author prefers freshly prepared solutions of the dried gland, as he has found that adrenalin solutions frequently produce a marked irritation of the mucous membrane. When adrenalin is used he advises using it in very weak solutions.

MEDICAL SOCIETIES.

PROCEEDINGS OF THE OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.*

CHARLES HIGGINS, F.R.C.S., Vice-President, in the Chair.

Friday, July 4, 1902.

DETACHMENT OF THE RETINA.

THE CHAIRMAN described a case of detachment of the retina in which complete recovery took place.

The patient was a lady, aged 36, who had been under his care since 1892 for myopia of a high degree, and had in 1899 nearly lost the sight of the left eye from detachment of the retina. In May, 1901, she first noticed obscuration of the upper part of the field in the right eye. There was a doubtful history of injury some weeks before. Detachment of the retina at its lower part was discovered. She was treated for nearly a month in hospital, lying in the prone position, with mercurial inunction and vapor baths, and she left with some improvement. Two weeks later her sight returned whilst lying down in the afternoon; she went to sleep for some hours, and on waking found the sight as good as it had been before the detachment occurred. Ophthalmoscopic examination showed some floating shreds in the vitreous, but no sign of detachment. On January 23, 1902—nearly nine months since the detachment appeared, and eight months since the recovery of vision—she could see with correction $6/24$ and J. 1. The field was almost normal, and there was no sign of detachment.

MR. E. H. CARTWRIGHT also read notes of a case of detachment after cataract extraction:

The patient was a man, aged 72, who had had a cataract removed from his right eye, without iridectomy, in February, 1899. Subsequently two capsulotomies had been done. In April, 1900, Mr. Cartwright first saw him, and with his correction he could read $6/6$ and J. 1. In January, 1891, he again attended, with the history that two weeks previously the sight of the right eye had suddenly failed late one day;

*British Medical Journal.

everything looked at appeared red, and the sight was lost below the horizontal meridian. The sight has got gradually worse since. The vision in the upper part of the field was equal to counting fingers at 6 inches. L. V.=P. L. Almost complete cataract. Projection good. In the right eye the upper half of the retina was detached, and this obscured the view of the disc. Urine and heart normal. The patient was kept in bed, and on January 9th a scleral puncture to the outer side of the superior rectus tendon as far back as possible was made, and from this some clear watery fluid exuded. January 25th—Disc visible, but vision was not improved. After this he was discharged, but was seen from time to time with gradually improving vision, until September, 1901, he could read $\frac{16}{18}$ and J. 2. The field was normal except on the temporal side. On September 27, 1901, the left cataract was extracted, and on November 29, 1901, his vision was as follows, with correction: R. V.= $\frac{6}{12}$ and J. 1; L. V.= $\frac{6}{6}$ and J. 1.

MR. MACLEHOSE mentioned a case he had seen of detachment due to a blow, which had recovered.

MR. HARTRIDGE thought that the experience of the authors was exceptionally good, for he himself had never seen a case of such complete recovery.

MR. JESSOP remembered only one case which had recovered, and this was reported by Mr. Nettleship and Mr. Tweedy to the Society some years ago. He had seen temporary improvement, but it never lasted.

MR. DEVEREUX MARSHALL said the only case of complete recovery he knew was the one referred to by Mr. Jessop. In a case he had had, where in the second eye the retina had become detached, a good result was obtained, and this lasted for several months, but it recurred, and the patient became quite blind. He also remembered another case due to a blow, in which the retina became re-attached, but as he had been unable to trace the patient after the first few weeks following the accident, he had not thought it well to publish it as a cure.

THE CHAIRMAN, in reply, said that he doubted very much whether the treatment adopted in his case had anything to do with the recovery of vision.

CONVERGENT STRABISMUS.

MR. SYDNEY STEPHENSON read a note on some cases of convergent strabismus treated by lengthening the tendon of the internal rectus, and exhibited the patients. The method adopted was that of cutting the tendon of the muscle, either obliquely or in some other manner by means of which the cut ends could be united in such a way that the muscle was thereby lengthened to the required degree. He had operated upon six cases with gratifying results.

THE CHAIRMAN thought that this method was likely to be of considerable benefit.

CARD SPECIMENS.

The following card specimens were shown: Mr. J. H. Parsons: (1) Gumma of the Ciliary Body; (2) Metastatic Carcinoma of the Choroid; (3) Annular Leucosarcoma of the Ciliary Body. Mr. Doyne: Rupture of Eyeball with Prolapse of Iris and No Dislocation of the Lens.

FIFTY-THIRD MEETING OF THE AMERICAN
MEDICAL ASSOCIATION.*

Held at Saratoga Springs, N. Y., June 10 to 13, 1902.

SECTION ON OPHTHALMOLOGY.

(Continued from last issue).

THIRD SESSION.

AN OPERATION FOR THE RESTORATION OF A CULDESAC
FOR THE WEARING OF AN ARTIFICIAL EYE,
WITH REPORT OF CASES.

JOHN E. WEEKS (New York) spoke of the difficulty of establishing a culdesac, the various operations, and said various kinds of tissue had been transplanted, a flap of integument or mucous membrane being most frequently used; partial success has attended all, but because of shrinking there is usually loss of the primary favorable result. The operation advised is to dissect the lid from the orbital tissue, carrying the dissection down to the tissue just above the periosteum; the skin on the inner aspect of the arm is taken as a flap, the margins of which are sutured to the margins of the defect and held in place by a sheet of rubber tissue lubricated

*American Medicine.

by bichlorid vaseline. Seven operations, all attended by success.

THE RELATIVE INDICATIONS FOR ENUCLEATION AND THE MULES OPERATION.

N. J. HEPBURN (New York) spoke of the indications for removal of the eyeball, viz., danger to fellow eye, pain in affected eye, extensive destruction of globe, malignant growth and cosmetic effect, and said it ranked with major operations, such as removal of a limb. The Mules operation is preferable when time of healing is no object, when the sclera is healthy and there is no affection of the optic nerve. The balls have been mostly of glass, but gold and platinum have been used, and lately experiments have been made with balls of hardened paraffine, which are lighter in weight, adaptable in size and nonabsorbable. The operation is contraindicated when sclera is not healthy and in malignant or tuberculous disease of any part of uveal tract; also in glaucoma and gouty affections, and where old cyclitis exists.

Discussion.—WOOD (Chicago) emphasized the difficulties of forming a culdesac and said the attempts to put in Thiersch grafts were almost invariably attended by failure; we must have something to hold the flap in place, and he usually used iodoform strips for this purpose; was glad to hear of Weeks' method.

BURNETT (Washington) related a case in which he had used a rubber piece something after the method of Weeks, getting a perfect culdesac measuring $2\frac{1}{2}$ inches from upper lid to bottom.

BLACK (Milwaukee) asked if paraffine could not be used in place of the rubber tissue.

TODD (Minneapolis) said he had inserted glass ball in 50 operations, and in only two did it come out, in one of which it was removed on account of irritation.

WEEKS, in closing, said it was necessary to attach the flap to some fixed point, and he preferred to attach it to the periosteum. It was necessary to have a firm sheet to hold the flap in position, and paraffine would be too friable.

HEPBURN said that the Mules operation had fallen somewhat into disrepute, but was being again resurrected, and in the last four years he had seen 70 or 80 cases, and thought

we were doing the operation better now because the cases are better chosen.

ON THE SYMMETRY OF OUR VISUAL APPARATUS AS A DUAL ORGAN. PLEA TO MODIFY THE CUSTOMARY NOTATION OF THE OCULAR MERIDIANS.

HERMAN KNAPP (New York) said that of 1,473 cases examined in 80 per cent. the meridians were symmetrically placed, and in 20 per cent. asymmetrically. The vertical meridian has the strongest curve about five times as often as the horizontal. In the intermediary positions the strongest meridian inclines to the nasal side about twice as often as to the temporal. In order to establish a uniform designation of the meridians of the eye and of the field of vision as well, he recommended a method which is to begin at the nasal end of the horizontal meridian in both eyes, counting upward and going all around the circle, which puts us in perfect harmony with the law of symmetry, and the diagram will read the same whether looked at from before or behind. The chart contains meridional and parallel circles all around, so that any point or defect can be designated by two numbers, that of the meridian and of the degree of latitude. The writer considered the proposition which he made at Utrecht, at the International Ophthalmological Congress, the best of many that had been tried, as it rested upon a scientific basis, is easy of application and meets the requirements of daily practice. The change from the old system would require:

1. A new plate on the spectacle frame for the left eye, placing zero on the nasal and 180 on the temporal side.
2. A diagram of the prescription with the same change for the optician.
3. Perimeter charts marked in the symmetrical way.

Discussion.—RISLEY (Philadelphia) said he regretted that he could not agree with Knapp as to the advantage of abandoning the methods employed for the past 30 years and confusing the records which had been made by the adoption of a new, unless it were an unquestionably better and more scientific method. He said that in all sciences where the circle is introduced the eastern or left-hand end of the horizontal line has been used as the starting point and the degrees counted upward, and we should hesitate before we divorce our oph-

thalmic records from a method so universally used by scientific men in all fields.

BURNETT (Washington) did not agree that the visual apparatus in man is a dual organ in the same sense that the hands are, but must be considered as a cyclopic eye and the symmetry of the visual apparatus does not consist in the relations, nasal and temporal, of each globe to a vertical plane. The cyclopic eye has no nasal and temporal, but a right and left side, and this method divides the visual apparatus into two halves, for which there is no warrant. He could see no practical advantage in it.

JACKSON (Denver) said the tendency is to get some one basis and use it in many departments of life, and we would do best to have our methods correspond to those of other branches of science.

CONCERNING THE SYMPTOMATOLOGY AND ETIOLOGY OF CERTAIN TYPES OF UVEITIS.

GEO. E. DE SCHWEINITZ (Philadelphia) spoke of the significance of the symptom, keratitis punctata, a deposit of opaque dots, generally arranged in a triangular form upon the posterior lamina of the cornea; three disease manifestations are encountered to which this name is applied: (a) keratitis superficialis punctata, (b) keratitis punctata vera, or syphilitica, (c) keratitis punctata. It has been noticed by many that when the characteristic deposits appear upon the posterior surface of the cornea recent patches of choroiditis are found often and perhaps always in some portion of the fundus; in all varieties of iritis corneal lesions are always demonstrable by careful examination. The causes of uveitis may be diathetic, toxic or infectious; as rheumatism, gout and diabetes; syphilis, gonorrhœa or tuberculosis; septic fever and diseases of the blood. He spoke of the symptomatology of recurrent and malignant uveitis terminating in secondary glaucoma and cataract and of the significance of the size, disposition and color of the deposits; of acute uveitis, beginning as a sclerotico-choroiditis, especially in young subjects, terminating in myopia and posterior polar lenticular opacity; of chronic uveitis of mild type in elderly subjects associated with haemorrhage in the vitreous; relapsing plastic uveitis, with reference to the insidious approach

of certain types in gouty and rheumatic subjects. In one form the primary lesion appears in the fundus as a well-defined choroidal change; in another class it appears first as a flitting conjunctival congestion, the hot eye of Jonathan Hutchinson, the vasomotor dilatation of Swan Burnett and the periodic episcleritis of Fuchs.

**AN ANALYSIS OF THIRTY-SEVEN CASES OF UVEITIS, WITH
SPECIAL REFERENCE TO (1) ETIOLOGY, (2) RELAPSES,
(3) RARE EARLY SYMPTOMS, (4) IMPO-
RANCE OF PERIMETRIC EXAMINATIONS.**

HIRAM WOODS (Baltimore) studied the cases from the standpoint of:

1. Visual symptoms with intraocular appearances, sudden and sometimes complete loss of sight, descemitis with metamorphopsia, photopsia, scotomas and muscae; dim areas in field brought out by perimetric examination.

2. Etiology; there were a small number showing syphilis, serofulsa or rheumatism, intestinal or menstrual disorders, acute systemic infection and sympathetic ophthalmia.

3. Relapses; the 37 cases indicate that menstruation in its establishment, or later if abnormal, intestinal disorders, and nasopharyngeal diseases are among the causes of plastic choroiditis, either as direct causes or by altering the resisting power. Cases of obscure etiology show a greater tendency to relapses; the changes in so-called choroidal hyperæmia demand guarded prognosis and repeated examinations.

THE DIAGNOSTIC SIGNIFICANCE OF KERATITIS PUNCTATA.

HARRY FRIEDENWALD (Baltimore) said that keratitis punctata interna, or descemitis, is observed in various vascular diseases, is found in every case of iritis, is an almost constant sign of exudative choroiditis and sometimes found in syphilitic choroiditis and acute and chronic cyclitis. When no other signs of uveitis are noted except descemitis, it is due to carelessness in examination. The writer has reported 53 cases, and even including the earlier ones, in which the examination was not made with the thoroughness of later years and those in which opacities of the media prevented examination, about three-fifths had exudative choroiditis. It is due to carelessness in examination that so many cases are recorded as serous iritis and serous cyclitis. Exudates in the

anterior portion of the choroid may be beyond the reach of ophthalmoscopic examination. We find descemititis in choroiditis only when there is exudative inflammation. "Serous iritis" and "serous cyclitis" have no clinical basis, and the terms should be discarded.

INJURIES OF THE EYE PRODUCTIVE OF DISEASES OF THE UVEAL TRACT.

HOWARD F. HANSELL (Philadelphia) said that the ocular injuries that produce diseases of the uveal tract include the great majority of traumatisms to which the eye may be subjected, and that apparently insignificant injuries are sometimes followed by disastrous results; that the character and intensity of the disease depends upon the nature of the injury and the condition of the patient when the injury is received; contusion, concussion, penetrating and incised wounds and the entrance and lodgment of foreign bodies, will almost always induce a plastic or purulent inflammation of the uveal tract from which recovery is seldom complete, and partial or complete loss of vision common; syphilitic, diabetic and tuberculous diathesis delay recovery; the diseases are modified by early surgical treatment; enucleation is to be practiced immediately when a foreign body lies imbedded in the ciliary region and cannot be extracted, or when the eye is mangled.

THE PATHOLOGY OF UVEITIS.

W. H. WILDER (Chicago) said all the divisions of the uveal tract, iris, ciliary body and choroid, may be involved by severe inflammation of any of them. He considered particularly lesions of the choroid. A satisfactory classification is difficult; may be grouped in plastic, serous and purulent forms; in acute suppurative choroiditis there is rapid infiltration of the vascular layers; vessels become blocked; external layers become distended by exudate; the retina is lifted up, and becomes involved in the inflammatory process; vitreous becomes turbid, and intraocular tension is increased. Panophthalmitis may result. Most cases are of traumatic origin, but may be metastatic, or pseudoglioma may result. In choroidoretinitis and central choroiditis changes in the vitreous may precede the choroiditis. The writer had observed opacities of the vitreous so fine as to escape hurried examination without a mydriatic.

PILOCARPIN INJECTIONS IN DISEASES OF THE UVEAL TRACT.

T. A. WOODRUFF (Chicago) observed that in treatment of diseases of the uveal tract, especially in exudative choroiditis, diseases of the vitreous and chronic irido-cyclitis, very few remedies were of value. Disturbance of the general health is a very frequent cause of inflammatory degeneration of this tract, although in many instances the etiologic factor is shrouded in mystery. Although many lesions are irreparable, a large minority are capable of improvement by the internal administration of thiosinamin, subconjunctival injections of mercury, common salt, etc. But none of them give as good results as the hypodermic injection of pilocarpin in gr. $\frac{1}{8}$ to $\frac{1}{4}$ doses in conjunction with the internal administration of potassium iodid. Sufficient emphasis has not been placed upon the extreme value of these agents in certain deep lesions of the eye.

Discussion.—DE SCHWEINITZ (Philadelphia) said he desired to emphasize, as his colleague (Friedenwald) had done the great importance of investigating the fundus in these cases. He believed the old methods of treatment were best, and had never seen a case in which some benefit could not be derived from mercury.

SNORT (Georgia) called attention to the great prevalence of the disease among negroes, and said that females were especially predisposed.

ZIEGLER (Philadelphia) said that turpentine was an excellent remedy in this class of cases, and thought its action somewhat similar to that in typhoid fever.

COULTER (Chicago) said that he had been struck by the tendency to recurrence of certain types of uveitis in the late winter or early spring months; and he had observed a number of cases in which he could predict a return of the trouble in the months of March and April; and in these cases he had noticed that elimination of the kidneys was below normal, with sometimes a slight suggestion of albumin.

CONNOR (Detroit) had obtained good results in the chronic cases by the use of potassium or sodium iodid, beginning with small doses and systematically increasing it.

GARDNER (Chicago) spoke of the value of exercise and electricity, saying they were excellent adjuvants.

WOOD (Baltimore), in closing, said the cases were much more frequent among females, and agreed with Woodruff as to the value of pilocarpin.

(Continued next issue.)

ABSTRACTS FROM MEDICAL LITERATURE.

BY W. A. SHOEMAKER, M.D.
ST. LOUIS, MO.

IRIDECTOMY FOR GLAUCOMA.

The following statistics are taken from an article by Dr. Fritz Mandel (*Berliner Klinische Wochenschrift*, Jan. 27):

ACUTE GLAUCOMA—73 CASES.

	No.	Per Ct.
Good results.....	47	64.4
Fairly good results	13	17.8
Not improved.....	9	12.3
Enucleated because of pain	4	5.4

CHRONIC INFLAMMATORY GLAUCOMA—35 CASES.

Good results.....	9	25.7
Fairly good results	18	51.4
Not improved.....	6	17.1
Enucleated (absolute glaucoma)	2	5.7

MONOCULAR GLAUCOMA—87 CASES.

Good results.....	4	4.6
Fairly good results	62	71.2
Not improved.....	17	19.5
Enucleated (absolute glaucoma)	4	4.6

SECONDARY INCREASE OF TENSION—54 CASES.

Good results	11	20.4
Fairly good results	16	29.6
Not improved.....	7	12.9
Enucleated (absolute glaucoma)	20	37

THE MICROSCOPIC EXAMINATION OF CONJUNCTIVAL DISCHARGE.

Edgar S. Thompson (*Pediatrics*, July 1st) describes the bacteriology of conjunctival discharges, mentions the form chiefly found, and the methods of staining. The Weeks' bacillus is most frequently found. It is a short, thin bacillus, shorter and somewhat thinner than the bacillus tuberculosis, and stains to nearly the same intensity as the pus cells—usu-

ally a little deeper—but not so deep as the pus nuclei. As a consequence, it is not so conspicuous as other more deeply-staining germs, and to find them the specimen must be carefully and closely examined. In typical cases they occur in large numbers, scattered in the mucus and between the cells and the pus cells. The gonococcus is a frequent form in severe cases of conjunctivitis, and the only form that can be confounded with it is the diplococcus intracellularis meningitis. It differs, however, as being mostly outside the cells and never within the nucleus; it also grows readily in cultures, while the gonococcus does not. It produces an acute purulent conjunctivitis, and usually differs a little in microscopic appearance from the gonococcus, but they may be exactly alike. The pneumococcus is frequently found as the cause of acute contagious conjunctivitis, or "pink eye." The various forms of staphylococcus occur commonly in conjunctival discharge, and have very little significance.

THE THERAPEUTIC USE OF SUPRARENAL EXTRACT IN THE
TREATMENT OF DISEASES OF THE EYE.

At a meeting of the New York County Medical Association, held May 19th, Dr. Wilbur B. Marple discussed this subject. He said that the action of the suprarenal extract in relieving inflammatory redness of the eye was certainly little short of magical, and it delighted the patient; but so also would the patient be pleased by the use of morphine for the relief of pain. We should ask ourselves seriously whether or not suprarenal extract was curative in the long list of diseases for which it had been recommended. His own experience led him to assert that it was not curative. Two cases of conjunctivitis were reported, in which, contrary to his instructions, adrenalin had been used for many weeks. Both patients found it necessary to increase the frequency of the instillations after a short time, and finally to increase the strength of the solution; and, instead of the drug being curative, it had distinctively aggravated the local condition. There could be no question that adrenalin would secure a bloodless operation, but he was far from being convinced that this use of the extract was desirable, although undoubtedly exceedingly convenient. There was certainly an in-

creased possibility of infection, and hence he would not think of using it in an operation in which the globe was opened; and there was reason for believing that the use of this remedy lowered the resistance of the tissues and interfered with healing. For slight operations on the eyelids the extract could be used apparently without harm, and enabled the operator to dismiss his patients from the office more quickly. A remarkable case was referred to, in which an epitheliomatous growth on the inner edge of the eyelid, which had existed for a number of years, began to diminish in size coincidently with the employment of adrenal in solution as a placebo. After having used this solution for a number of months, it was found that the growth had entirely disappeared, and the cosmetic result was far better than could have been secured with the knife. The action of adrenalin in this case was explained by Dr. Marple on the theory that it destroyed the blood supply of the epitheliomatous mass. The patient was exceedingly susceptible to the action of adrenalin, because when a pledget of cotton moistened with this solution was laid upon this lady's cheek the skin became white underneath the cotton.

OPTIC NEURITIS IN BRAIN DISEASE.

De Lapersonne (*Gaz. des Hop.* (Paris), February 8 to June 24) calls attention to the following points: In case of a cerebral neoplasm or a localized syphilitic lesion in the brain the optic fibres are comparatively little affected; while there may be a decided congestion of the papilla, central and peripheral visual acuity is frequently but slightly impaired. The contrast between the extensive and severe lesions of the papilla and the acuteness of vision, which frequently remains from one-third to one-half, is quite striking. Perles and Uhthoff have reported cases of congested papillæ, in cases of syphilitic gummata which completely recovered. Complete cures of edema of the papilla have been reported, after trephining. On the other hand, septic neuritis, the result of meningitis and meningeal tuberculosis, has the element of infection superadded to the edema of the optic nerve, and the result is rapid destruction of the optic fibres.